Claims

[c1]   What is claimed is:

1. An automatic-packaging apparatus for packaging an optical sensing module including a lens and an optical sensor, comprising:

a base for supporting the lens and the optical sensor, comprising an adjustment device for adjusting the distance between the lens and the optical sensor;

an image-analyzing module for analyzing an image signal received from the optical sensor and outputting an analyzed result;

a distance-adjusting module, coupled to the base and the image-analyzing module, for controlling the adjustment device to adjust the distance between the lens and the optical sensor according to the analyzed result; and

a packaging module for packaging the lens and the optical sensor into an integral part.

[c2]   2. The automatic-packaging apparatus in claim 1 wherein the distance-adjusting module comprises a motor.

[c3]   3. The automatic-packaging apparatus in claim 1 wherein the image-analyzing module is used to deter-

mine whether there are stains or broken points on the lens or on the optical sensor according to the image signal.

[c4] 4. The automatic–packaging apparatus in claim 1 further comprising a stain–detecting module which is coupled to the base for determining whether there are stains or broken points on any one of the lens and on the optical sensor according to the image signal and a predetermined standard image.

[c5] 5. The automatic–packaging apparatus in claim 4, wherein the stain–detecting module comprises a memory to store the predetermined standard image.

[c6] 6. The automatic–packaging apparatus in claim 1 further comprising a memory built in the image–analyzing module for storing the image signal.

[c7] (a)
7. A method of packaging an optical sensing module including a lens and an optical sensor, comprising:
(a)receiving an image signal from the optical sensor;
(b)extracting a portion of the image signal;
(c)calculating an FD of the portion of the image signal;
(d)adjusting the distance between the lens and the optical sensor according to the FD; and

(e)packaging the lens and optical sensor into an integral part.

[c8]   8. The method of claim 7 wherein calculating an FD comprises the following steps:

(c1)in the portion of the image signal, obtaining a square of a horizontal deviation Gx^2, wherein $Gx = g(x,y)-g(x+1,y)$;

(c2)in the portion of the image signal, obtaining a square of a vertical deviation Gy^2, wherein $Gy = g(x,y)-g(x,y+1)$; and

(c3)calculating $Gx^2 + Gy^2$ and then obtaining the FD.

[c9]   9. The method of claim 7 wherein in step (d) adjusting the distance between the lens and the optical sensor involves adjusting the distance in a convergent way.

[c10]   10. The method of claim 7 wherein in step (d) adjusting the distance between the lens and the optical sensor desires to determine the distance rendering the maximum value of FD.